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REMARKS

Claims 1 to 20 remain in the present application with claims 18 to 20 being withdrawn from consideration pursuant to a restriction requirement. Accordingly, only claims 1 to 17 are subject to examination. Claim 1 has been amended for which there is support in the specification, claims and drawings as originally filed.

Reconsideration of the Examiner's decisions and reexamination of this application are respectfully requested.

The §112 rejections:

Claims 1 to 17 have been rejected by the Examiner under 35 USC §112, first paragraph.

According to the Examiner, claim 1 requires reacting two reactants to form silicon but the specification does not list what those reactants are.

The reactants are readily apparent to a person skilled in the art. The particular reactants are not important to the invention, only that there are reactants to form the silicon. Indeed, Chen et al. U.S. Patent Application Publication US 2006/0046383, cited by the Examiner, discloses reactants. However, to further the prosecution of the present application, Applicants have amended claim 1 to recite "depositing a layer of silicon on a surface of said workpiece". The end result is the same, forming the silicon. Such a limitation is fully supported by the specification such as at [0007].

Accordingly, the rejection of claims 1 to 17 under 35 USC §112, first paragraph, is believed to have been overcome.

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The §103 rejections:

Claims 1 to 17 have been rejected by the Examiner under 35 USC §103(a) as being unpatentable over Forbes U.S. Patent Application Publication US 2005/0146938 (hereafter "Forbes") in view of Yamazaki et al. US 2002/0106841 (hereafter "Yamazaki").

The Examiner's remarks have been carefully considered; however, it is believed that the combination of Forbes and Yamazaki do not render Applicants' claims obvious.

Forbes merely discloses the formation of nanocrystals. There is no teaching regarding the temperature at which the crystals are formed. Applicants, however, have noted at [0005] "maintaining the temperature of the wafer being coated at a temperature close to and only slightly above the crystallization temperature." Yamazaki merely discloses heat lamps above and below the substrate for rapid thermal annealing of the substrate after the formation of the crystallized silicon film (Abstract).

Applicants' invention is directed to two aspects. The first aspect is directing more of the heating power to a lower surface of the workpiece and the second aspect is heating the substrate well above the crystallization temperature of the silicon. As a result of Applicants' invention, the smallest grain size is unexpectedly obtained.

With respect to claim 1, more of the heating power is directed to a lower surface of the workpiece while maintaining the workpiece at a deposition temperature greater than a crystallization of silicon. Forbes provides no teaching regarding heating the workpiece. Yamazaki does provide some teaching regarding heating the workpiece but this is in the context of rapid thermal annealing after the formation of the crystallized silicon and teaches nothing regarding heating the workpiece during the formation of the silicon layer. Moreover, Yamazaki teaches nothing regarding the proportion of heating

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from the various heat lamps. There is no teaching in Yamazaki regarding varying the temperature of the heat lamps between the lower and upper heat lamps to produce any different results. Thus, there is no indication in the prior art that any different results could be obtained by varying the heating power from the upper and lower heat lamps.

Applicants are aware of In re Aller. However, it is also a condition precedent to the application of In re Aller that the particular parameter must first be recognized as a result-effective variable. MPEP §2144.05.II.B. It is submitted that there is no teaching in Forbes or Yamazaki that varying the heating power between the upper and lower heat lamps, and thus also the upper and lower surfaces of the workpiece, produces any different results and thus there is no indication that the parameter of varying the heating power between the upper and lower heat lamps is a result-effective variable. Accordingly, In re Aller does not apply. Since the Examiner has failed to state a prima facie case of obviousness with respect to claim 1, claim 1 must be considered to be allowable.

Inasmuch as claims 2 to 17 depend from claim 1, and since claim 1 is believed to be allowable, then claims 2 to 17 are believed to be allowable as well. In addition, claims 3 to 17 are believed to be independently patentable as well. Each of these claims pertain either to the high percentage of heating power directed to the lower surface of the workpiece or the temperature of the substrate which is far above the crystallization temperature of the silicon. Neither of these features are taught or suggested in the prior art. As can be seen from Tables I and II of Applicants' specification, unexpected results are obtained according to Applicants' process.


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Summary:

In view of all of the preceding remarks, it is submitted that claims 1 to 17 are in condition for allowance. If the Examiner finds this application deficient in any respect, the Examiner is invited to telephone the undersigned at the Examiner's earliest convenience to resolve such deficiency.

Respectfully Submitted,
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